Coffin (M.) Métaphysique du Calcul Différentiel. 8vo. *Arras* 1869. The Author.

Galton (F., F.R.S.) Hereditary Genius: an Inquiry into its Laws and Consequences. 8vo. *London* 1869. The Author.

Gautier (—.) Notices Sommaires sur Divers Travaux, Rapports et Etablissements Astronomiques. 8vo. *Genève.* The Author.

Listing (J. B.) Ueber eine Art stereoskopischer Wahrnehmung. 12mo. *Göttingen* 1869. The Author.

Zeitschrift für Biologie, von L. Buhl, M. Pettenkofer, &c. Band II. Heft 2, 3; Band IV. Heft 2–4. 8vo. *München* 1866–69. The Editors.

November 30, 1869.

ANNIVERSARY MEETING.

Lieut.-General Sir EDWARD SABINE, K.C.B., President, in the Chair.

Dr. T. Graham Balfour, on the part of the Auditors of the Treasurer's Accounts appointed by the Society, reported that the total receipts during the past year, including a balance of £493 14*s.* 6*d.* carried from the preceding year, and the Oliveira and Davy bequests, amount to £6753 6*s.* 3*d.*; and that the total expenditure in the same period, including the Oliveira bequest on deposit, and the investment of the Davy bequest, amounts to £6429 1*s.* 8*d.*, leaving a balance of £298 18*s.* 5*d.* at the Bankers, and of £25 6*s.* 2*d.* in the hands of the Treasurer.

The thanks of the Society were voted to the Treasurer and Auditors.

The Secretary read the following Lists:—

Fellows deceased since the last Anniversary.

On the Home List.

The Rev. Henry Hervey Baber, M.A.
Arthur Kett Barclay, Esq.
The Rev. John Barlow, M.A.
Sir John Peter Boileau, Bart.
John Cam Hobhouse, Lord Broughton.
William Clark, M.D.
John Dickinson, Esq.
William Fishburn Donkin, Esq., M.A.
Sir Henry Ellis, K.H.
James David Forbes, LL.D.
Thomas Graham, M.A., D.C.L.
Joseph Hodgson, Esq.
John Hogg, Esq., M.A.
Levett Landon Boscawen Ibbetson, K.R.E. & H.
Joseph Beete Jukes, Esq., M.A.
Joseph Jackson Lister, Esq.
George Lowe, Esq.
Gilbert Wakefield Mackmurdo, Esq.
John Rogers, Esq.
Peter Mark Roget, M.D.
Sir James Emerson Tennent, Bart., LL.D.
Lieut.-General Thomas Perronet Thompson, M.A.
George Witt, Esq.

On the Foreign List.

Carl Friedrich Philip von Martius. | Johannes Evangelista Purkinje.

Change of Title.

The Bishop of London	to	Archbishop of Canterbury.
Lord Stanley	to	Earl of Derby.
Lord Justice Sir W. Page Wood	to	Lord Hatherley.

Fellows elected since the last Anniversary.

Sir Samuel White Baker, M.A.
John J. Bigsby, M.D.
Charles Chambers, Esq.
William Esson, Esq., M.A.
Prof. George Carey Foster, B.A.
Robert Arthur Talbot Gascoigne-Cecil, Marquis of Salisbury, M.A.
William W. Gull, M.D.
Richard Monckton Milnes, Lord Houghton, M.A., D.C.L.
J. Norman Lockyer, Esq.
John Robinson M'Clean, Esq.
St. George Mivart, Esq.
John Russell Reynolds, M.D.
Vice-Admiral Sir Robert Spencer Robinson, K.C.B.
Major James Francis Tennant, R.E.
Prof. Wyville Thomson, LL.D.
Col. Henry Edward Landor Thuillier, R.A.
Edward Walker, Esq., M.A.

On the Foreign List.

Alphonse De Candolle.
Charles Eugène Delaunay.
Louis Pasteur.

Readmitted.

Sir John Macneill. | Edward Solly, Esq.

The President then addressed the Society as follows :—

Gentlemen,

One of the first subjects to which I have to draw your attention is the Royal Society's Catalogue of Scientific Papers, the printing of which, I am happy to report, proceeds satisfactorily. The third volume, which I lay before you, is now completed, carrying the Index of Titles in alphabetical order as far as Lez inclusive; and good progress has been made in correcting the proofs of the fourth volume. Each succeeding volume of the work, of course, adds to its practical utility, which continues to be thankfully acknowledged by cultivators of science in various parts of the world.

But while the aid to be derived to scientific research from the index arranged according to authors' names is fully recognized, there can be no doubt that the value of the Catalogue will be greatly enhanced by the fulfilment of the second part of the plan announced in the preface, namely, by the publication of an *Alphabetical Index of Subjects*. The preparation of such an "*Index Rerum*" as is contemplated has been for some time a subject of anxious as well as careful consideration by the Library

Committee, and they have at length arrived at what, they have reason to hope, will be a most satisfactory solution of the question, through a communication with Professor Julius Victor Carus, of Leipsic, who they found would be willing himself to undertake the task. I am happy to announce that the Council, acting on the recommendation of the Library Committee, have entered into a very satisfactory arrangement with Professor Carus, who will be able to commence his labours in the ensuing spring. From the well-known scientific accomplishment of Professor Carus, and his extensive experience in the peculiar work to be performed, as well as the confidence which will be reposed in him by all acquainted with the nature of the undertaking and interested in its success, we may consider the Society most fortunate in securing his services.

The Meteorological Department of the Board of Trade, superintended by a Committee of the Royal Society, is making good progress, under the able direction of Mr. Robert Scott, towards the fulfilment of the objects for which it was constituted. In respect to the Meteorology of the United Kingdom, the seven observatories distributed over its surface and maintained at the public expense are all in thoroughly good working order, transmitting their self-recorded results monthly to the central establishment, where they undergo a careful revision before their final acceptance. The first publication of the numerical results, which will be complete for each of the seven observatories for the year 1869, will take place towards the end of the first quarter of 1870, and similarly in subsequent years, and will be followed at brief intervals by graphical representations illustrating the phenomena of the weather at times of its most important disturbances.

The other departments of the office show also a healthy activity. As regards Ocean Meteorology, the Committee have been enabled to increase their staff, and so to accelerate materially the investigations alluded to in my address of last year; while the collection of new observations of a high character is also going on steadily. The system of Weather Telegraphy is making solid advances. The Drum Signal is now hoisted at upwards of 100 British Stations, and intelligence of atmospheric disturbances felt on our shores is transmitted to the coasts of the continent from Norway to Spain. The results of the transmission of such news to Hamburg have been especially satisfactory.

The extension of telegraphic communication to the north of Scotland has enabled the Committee to adopt Wick as an observing-station, while the Norwegian authorities have resolved to make use of the direct cable laid down last summer between Scotland and their coast, to exchange information daily with the office in London. Hitherto the reports from Norway have always reached us *viâ* Paris, whereby delays were occasioned.

The attention of the Committee has also been directed to instituting discussions of the statistics of our weather. The results already obtained in this field lead us to hope that the practical value of such inquiries will soon be manifested.

The great Melbourne Telescope arrived at its destination in November 1868, without injury of any importance—which, perhaps, could hardly have been expected after a voyage of 16,000 miles, for an instrument at once so massive and so delicate!

The Visitors of the Melbourne Observatory thought it advisable to adopt the suggestion of Dr. Robinson to provide the telescope with a covering, and for this purpose they preferred the second of the plans which he proposed—a rolling roof. This appears to have been satisfactorily executed. It protects the telescope completely, and can be removed by a single workman, leaving the telescope fully exposed to the sky.

In erecting the instrument some trifling difficulties seem to have been experienced, and it was not fit for actual work until the beginning of last June, which is midwinter there, a season when cloudy weather prevails to an extent which we were scarcely prepared to expect, and which is stated to have been this year excessive. For these reasons the habitual work of the telescope had not been commenced up to September.

Its performance since erection does not appear to have given altogether the same satisfaction at Melbourne that it did at Dublin; but the defects complained of may arise partly from an imperfect knowledge of the principles of the instrument and inexperience in the use of so large a telescope, partly from experimental alterations made at Melbourne, and partly from atmospherical circumstances. Those who are acquainted with the difficulties which Sir J. F. W. Herschel experienced at the Cape, will not be surprised that they should be felt at Melbourne to a much greater extent, on account of the far greater size of the speculum. But I have no doubt that if the instrument be kept in its original condition and as carefully adjusted as it was at Dublin, it will perform as well in ordinary observing-weather.

The high impression of its power produced by the trials which were made of it when at Dublin, is maintained by a sketch of a portion of the Great Nebula near η Argus, made by M. Le Sueur during two nights in June last.

Some change in this nebula from the time when it was described by Sir J. F. W. Herschel had been indicated by Mr. Powell and other observers, though with instruments so much inferior in power to his 20-foot reflector, that little reliance could be placed on them; however, here the evidences of change are indisputable. The peculiar opening in the nebula, which Sir John Herschel has compared to a lemniscate, is still very sharply marked, but its shape and magnitude have altered. Its northern extremity is opened out into a sort of estuary; one of the remarkable constrictions seen in 1834 has disappeared, and the other has shifted its place. Two stars which were then exactly on the edges of the opening are now at some distance within the bright nebulosity; the nebula has become comparatively faint near η Argus.

Another remarkable change is the formation of a V-shaped bay south

and preceding the lemniscate, whose edges are so bright that if it had then existed it could not have been overlooked in the 20-foot reflector. Another feature, which, however, was perhaps not within reach of that telescope, is an oval which M. Le Sueur describes as "full of complicated dark markings and pretty bright nebular filaments." The angular magnitude of the changes which have been thus observed is so great as to suggest a strong probability that this nebula is *much nearer* to us than the stars which are seen along with it. It may be also noticed that M. Le Sueur saw nothing to make him believe in any development of stars in addition to those seen by Sir J. F. W. Herschel.

The spectroscope and photographic apparatus belonging to the instrument have by this time reached Melbourne, and will no doubt give good results, subject to the condition that the fascination of their use shall not be permitted to interfere with the primary destination of the telescope, viz. the observation of nebulæ.

Celestial spectroscopy has indeed attained such importance, that it requires for its successful prosecution the undivided attention of the astronomer who devotes himself to it, as well as an observatory specially designed for it. Our great national observatories cannot supply this want, for they have their own specific destination; and the high optical power which is required, if we wish to make further progress, is scarcely within the reach of amateurs.

These considerations have induced your Council to believe that an attempt to encourage and aid this most interesting class of researches is an object in full unison with the highest purpose of the Royal Society's existence; and they have therefore, after most careful deliberation, resolved to act on this conviction by providing a telescope of the highest power that is conveniently available for spectroscopy and its kindred inquiries. The instrument will, of course, be the property of the Society, and will be intrusted to such persons as, in their opinion, are the most likely to use it to the best advantage for the extension of this branch of science; and, in the first instance, there can be but one opinion that the person so selected should be Mr. Huggins.

The execution of this project was much facilitated by the receipt of £1350 from a bequest made to the Society by the late Mr. Oliveira; and in the beginning of the year proposals were received from the chief opticians of the time, of which that of Mr. Grubb was accepted last April.

The conditions proposed were, that the object-glass of the telescope should be of 15 inches aperture, and not more than 15 feet focus, that the arrangements of its equatorial should be such that it could be easily worked by the observer without an assistant, and that the readings of its circles could be made without leaving the floor of the observatory. Mr. Grubb was fortunate enough to secure two disks which had been exhibited by Messrs. Chance at the French Exhibition. They are of first-rate transparency; and as the construction which has been adopted admits of

the lenses being cemented, this object-glass will transmit an unusually large portion of light. The respective indices of the glasses were determined by making facets on their edges at an angle of 60°, and observing spectral lines through the prisms thus formed with a spectroscope of such magnitude as to admit of their being placed on its table. The distinctness with which even faint lines were seen through 12 inches of the glass is a most satisfactory proof of its purity and clearness. From these Professor Stokes computed the curves for the lenses; and his numbers were almost identical with those which Mr. Grubb had obtained.

I may mention that some fears had been entertained that the equality of curvature in the adjacent surfaces might *call up a ghost*, if the lenses were used uncemented, and that this has been tried and no such effect was visible. Subsequently a rather novel addition has been made, bearing upon the radiation of heat from the stars. An object-glass intercepts so much of the heat-rays that, to economize the infinitesimal effect which is expected, a metallic mirror is more promising. The equatorial is therefore, at the suggestion of Mr. De La Rue, provided with the means of changing the 15-inch achromatic for an 18-inch reflector; and this has been accomplished by means notable for their facility and their safety.

The instrument will be ready for trial in December of the present year. In the meantime it may be said that the object-glass, notwithstanding the difficulty of working one of so short a focus, gives promise of very high excellence.

With respect to the equatorial, it has been ascertained that a force of 2 lb. applied at the eyepiece is sufficient to move the telescope easily on its declination axis, and $1\frac{1}{2}$ lb. on its polar axis; however, when all its parts are put together, these forces may require to be increased $\frac{1}{5}$.

The anticipations which I ventured to express in may last year's Address, of the renewal in the summer of the present year of the researches on the temperature of the sea at great depths, and on the nature of the sea-bottom and the life existing in its vicinity, have been realized by an ample provision on the part of Her Majesty's Government, and a devotion on the part of the Fellows of the Royal Society, viz. Dr. Carpenter, Prof. Wyville Thomson, and Mr. Gwyn Jeffreys, meriting the highest praise. The existence of persistent deep-sea currents of very different temperatures in proximity to each other, and their influence on the inhabiting forms of life and on the nature of the sea-bed, together with the great extension of our knowledge of the variety and characteristics of the new forms of life which have been discovered, justify the belief that we have embarked on a field of discovery and research which will not soon be exhausted, and which will have no unimportant bearing on the earlier geology of our globe, as well as on our knowledge of the life at present existing on the submerged portions of its surface.

It had long been inferred by naturalists that species of the marine

Invertebrata may have a far wider extension on the surface of the globe than is the case with the inhabiters of the land. The correctness of this inference received the fullest confirmation by the researches of the late Admiral Sir James Clark Ross, whose dredges brought up from the depths of the Antarctic Ocean individuals of species which were well known to him from his earlier dredging operations in the Arctic seas. These animals are known to be particularly sensitive in regard to temperature; and we have no reason to doubt his conclusion, that water of similar temperature to that of the Arctic and Antarctic seas exists in the depths of the intermediate ocean, and may have formed a channel for the dissemination of species. The barrier which the heated regions of the tropics present to the migrations of the land animals of colder climates does not exist in the case of many of those inhabitants of the sea whose remains constitute a large portion of the fossiliferous strata of the globe.

The Fellows will not have forgotten the important paper on the Flora of North Greenland by Prof. Oswald Heer, which was read last winter, and which will speedily be in their hands in the forthcoming volume of the Transactions. The inquiries carried on by this eminent botanist have determined, beyond the possibility of cavil, the climatological conditions of the Arctic regions at a geological epoch which is comparatively recent (the Miocene), and have shown that they must have resembled very closely those now prevailing in latitudes at least 20° lower; for such is the zone inhabited by the living representatives of the plants found fossil by him in the localities in which they grew.

The specimens brought by the recent Swedish Expedition from Spitzbergen have also been submitted to his examination; and it appears that a portion of these, from Advent Bay, belong to the Quaternary Epoch. It will therefore be a matter of no small interest to determine accurately the changes of climate which took place in that locality at the expiration of the Miocene era.

I proceed to the award of the Medals.

The Copley Medal has been awarded to M. Victor Regnault, Foreign Member of the Royal Society, for the second volume of his 'Relation des Expériences pour déterminer les lois et les données physiques nécessaires au calcul des Machines à Feu,' including his elaborate investigations on the Specific Heat of Gases and Vapours, and various papers on the Elastic Force of Vapours.

The name of M. Victor Regnault has been associated for the last quarter of a century with the most refined and delicate experimental inquiries connected with the measurement of heat. The amount of labour involved in his researches upon the specific heat of simple and compound bodies, upon the dilatation of gases and vapours, upon the comparison of the air-thermo-

meter with the mercurial thermometer, upon the elastic force of aqueous vapour, upon the determination of the density of gases, and upon hygrometry must excite the astonishment of all who can estimate the difficulty of the problems attacked, the precision of the results attained, and the fundamental character of the data which he has determined.

These researches were published before the year 1850; many of them were embodied in the first volume of his 'Relation des Expériences pour déterminer les lois et les données physiques nécessaires au calcul des Machines à Feu." The Royal Society marked their sense of the importance of these earlier labours of M. Regnault by the presentation of the Rumford Medal in the year 1848.

He has since published the second volume of that great work, to which more especially the Copley Medal is now awarded. It embraces a series of researches even more delicate and difficult; to use the words of one whose recent loss we all deplore, and whose opinion on this subject possesses a weight which is equalled by few, viz. the late Mr. Graham, "in these researches a degree of precision is attained, where precision is all-important, which appears never to have been surpassed, or perhaps even approached before in similar inquiries. The results are data of a fundamental character, to the completion of which chemists and natural philosophers have been looking anxiously for years past, and which they have now received from the hands of M. Regnault with a feeling of entire confidence."

The researches on the specific heat of gases and vapours, alone, constitute a monumental work. Upon this subject the most discordant results had been obtained by experimental investigators of tried skill and ingenuity; and the problem, notwithstanding its importance, exhibited a series of perplexing contradictions.

Before commencing his own experiments, M. Regnault submitted the various methods of previous inquirers on the subject to a minute comparison and criticism, particularly those of Delaroche and Bérard, of Haycraft, and of Apjohn and Suesman. M. Regnault finally adopted a method based upon the one proposed by Delaroche and Bérard. The principle of it may be explained in a few words.

A current of the compressed gas under experiment is made to traverse at a uniform velocity a metallic worm maintained at a uniform temperature. The heated gas is then transmitted through a calorimeter, and the amount of the following quantities determined, viz.:—1, the weight of the gas employed; 2, the cooling of the gas; 3, the rise of temperature of the water in the calorimeter. From these data the specific heat of the gas is calculated.

Amongst various special contrivances required for avoiding error, it was necessary to have the means of regulating the escape of the gas with sufficient uniformity, and for preventing its issue from the calorimeter at varying pressures.

Some idea of the enormous amount of labour bestowed upon these researches may be formed from the fact, that not fewer than eighty-four experiments were made upon the specific heat of air, under different pressures and temperatures, forty-three upon aqueous vapour, twenty-four upon carbonic acid, and a considerable number upon other important gases and vapours, embracing no fewer than thirty-six different elementary and compound bodies, many of which required special modifications of the method and apparatus employed.

Besides this remarkable series of researches, M. Regnault has embodied in his work:—investigations on the compressibility of gases under wide variations of pressure, and on the specific heat of liquids at different temperatures; also a second memoir on the elastic force of saturated vapours at different pressures, which he has extended to the compressed gases, and to the density of vapours emitted by saline solutions and by mixed liquids. In addition to all these, he has a memoir on the latent heat of vapours at different tensions.

This extended series of investigations is carried out with minute and scrupulous precision, and the sources and limits of error are traced and guarded against with unvarying skill and sagacity. The publication of this work, the greatest experimental contribution of any single individual to the science of heat, must indeed mark an era in the history of thermotics, and furnish data of enduring value both to the chemist and the physicist in all that concerns specific and latent heat, and the laws of elastic force as acting on aëriform bodies.

Professor Miller,

We greatly regret that we are deprived of the pleasure of Monsieur Regnault's presence by reason of illness in his family. I will therefore request you to receive the Medal on his behalf, and to transmit it to him with the assurance of the Society's highest respect.

The Council has awarded a Royal Medal to Sir Thomas Maclear, Astronomer Royal at the Cape of Good Hope, for his Measurement of an Arc of the Meridian at the Cape of Good Hope.

Our sole knowledge of the figure of the southern hemisphere rests on the arc of the meridian measured by La Caille, and now remeasured and extended by Maclear. The original measurement, notwithstanding the well-known ability of the great astronomer under whose superintendence it was executed, has not commanded confidence. The magnitude of the degree inferred from it is far too great, and, if accepted, would lead to the conclusion that the dimensions of the two hemispheres are dissimilar. But La Caille's angles were observed with a quadrant, not with a circle, and were therefore liable to errors of eccentricity and of figure; while the effects of local attraction, if recognized at all, were very imperfectly ap-

preciated. These considerations induced Maclear, shortly after his appointment to the Cape Observatory, to plan the verification which he has now accomplished. Pursuing the still earlier inquiries of Sir George Everest, he succeeded, though with considerable difficulty, in recovering La Caille's terminal stations; and, aided by the advice and encouragement of Sir John Herschel (then at the Cape) and of the Astronomer Royal, he commenced the work of a remeasurement in 1836. The proceedings were necessarily tedious: the measurements of the base, of the triangles, and of the zenith-distances were repeated to an extent and with precautions unpractised at the earlier period. The zenith-distances were observed with the sector with which Bradley discovered the aberration of light and the nutation of the earth's axis, intrusted to Maclear by the Admiralty. The terrestrial angles were taken with a 20-inch circle by Jones, and a smaller theodolite by Reichenbach, both of remarkable precision. The base, from which all the distances were derived, was measured with the compensation bars used in the Irish triangulation. Thus, in respect to the means employed, this arc of the meridian may be regarded as inferior to none on record. A full account of the whole was completed in 1866, and has been published by the Admiralty in two quarto volumes. It does not confirm the abnormal value obtained by La Caille, but shows a probable cause for the discordance. La Caille's northern station was in a hollow surrounded by mountains, one of which, half a mile distant to the north, was a mass of rock 2000 feet high; and others, at distances somewhat greater, were still near enough to create disturbance. A station so situated was obviously ill suited to be a terminal station; and the triangulation was therefore extended across an immense plain of sand to a point without any visible source of local attraction. By this extension, and by a similar one to the south, Maclear's arc has an amplitude nearly four times as great as that of La Caille, and is, on this account, as well as on account of the greater accuracy in detail, far more deserving of confidence. The degree which is derived from it is 1133 feet shorter than that of La Caille; and as La Caille's is 1051 longer than that given by the spheroid which, according to Airy, represents the average of northern arcs, Maclear's determination is evidently a near approximation to the truth. This is even more distinctly shown by the close agreement of the latitudes computed from the geodetic measurements with those given by the sector—that of the north extremity being $0{\cdot}4''$ in defect, that of the south extremity $0''{\cdot}5$ in excess.

Captain Richards,

We should indeed have been happy to have had Sir Thomas Maclear's presence among us; but in his present unavoidable absence I will request you to receive this Medal on his behalf, and to transmit it to him with the assurance of the very great pleasure which it will give to the Society to welcome him on his return to his native country.

A Royal Medal has been awarded to Dr. Augustus Matthiessen, F.R.S., for his researches on the electrical and other physical properties of metals and their alloys.

The earlier of Dr. Matthiessen's published researches related to the preparation of the metals of the alkaline earths. Having succeeded in establishing or perfecting methods for the production of these, he proceeded to institute a far more complete examination of their physical properties than had previously been attempted. These researches appear to have led to his investigation of the more important physical properties of the principal metals and their alloys. In some of these investigations Dr. Matthiessen associated himself with younger workers in science of proved ability, Messrs. Holzmann, Box, and Vogt; and the results arrived at were included in a series of nine papers published in the 'Philosophical Transactions.' They embrace the determinations of the specific gravities, the expansion due to heat, the thermo-electric properties, the electric conducting-power, and the effects of temperature upon the electric conducting-power.

The laws deduced from the results of Dr. Matthiessen's electrical experiments are now in constant use by telegraphic engineers. The causes of the great variations observed in the electric conducting-power of commercial copper were first elucidated by him, and an important report was made by him on this subject in 1860 to the Committee appointed by Government to inquire into the construction of Submarine Telegraph Cables. His investigation of this subject has resulted in very great improvement of the conducting-power of the copper wire used in submarine telegraphy. Closely connected with this branch of his researches are the investigations which Dr. Matthiessen carried out for the Electrical-Standard Committee of the British Association, of which he was one of the most active members. The resistance-coils issued by that Committee, which have been very generally adopted as standard instruments, are all constructed of an alloy of platinum and tin, which, after a long series of experiments, Dr. Matthiessen recommended as specially fitted for that purpose.

Under the auspices of the British Association, Dr. Matthiessen undertook, a few years ago, the investigation of the chemical constitution of cast iron, and of the influence exerted upon the physical properties of that metal by the several other elements which generally occur in association with it. With these objects in view he has laboured most perseveringly in the preparation of iron in a chemically pure condition, and in quantities sufficient to admit of the attainment of thoroughly trustworthy results in the study of the physical and chemical properties of the pure metal and of its alloys. His researches in this direction have recently been crowned with success; and the method of producing pure iron, which he has elaborated, promises to be fruitful in interesting and important results in the hands of himself and the other chemists with whom he has been associated in this inquiry.

Dr. Matthiessen's researches, published in the Philosophical Transactions, on the action of oxidizing agents upon organic bases and on the chemical constitution of narcotics (the latter investigation having been conducted in conjunction with Professor G. C. Foster), furnish proofs of the success of his labours in organic chemistry. The accounts published in our 'Proceedings,' of the results of his most recent researches in this branch of chemical science, show that he has entered upon a line of investigation as productive of interesting and important results as any which he has yet pursued. Thus, he has already established an intimate relation between the organic bases morphia and codeia, and has shown that when either of these is treated with hydrochloric acid, a new base is produced, which he has called apomorphia, and which, though only differing from the powerful narcotic morphia by the elements of water, possesses the very distinct characteristics of a most powerful emetic. The substance known as Papaverine, hitherto regarded as a distinct organic base, is at the present time the subject of Dr. Matthiessen's study, and promises to yield results of considerable interest.

Dr. Matthiessen's researches are distinguished as well for their diversity as for their uniformly complete and trustworthy character.

Dr. Matthiessen,

I have great pleasure in presenting you with this Medal, which you will receive as a mark of the value which the Royal Society attaches to your researches, and the interest with which it regards your continuation of them.

Before concluding, I have to acquaint you that the Society will in future years have an additional Medal to bestow. Dr. John Davy, brother of Sir Humphry Davy, has bequeathed to the Royal Society, in fulfilment of an expressed wish of his illustrious brother, a service of Plate, presented to Sir Humphry Davy for the invention of the Safety Lamp, to be employed in founding a Medal to be given annually for the most important discovery in Chemistry made in Europe or Anglo-America. The directions given in the will, respecting the manner in which the plate should be disposed of, have been fulfilled, and the proceeds invested in India securities, yielding a little more than £30 a year; and it now remains with your Council to determine the form of the Medal, and to specify the conditions under which it will be awarded.

On the motion of Capt. Richards, seconded by Mr. Abel, it was resolved,—"That the thanks of the Society be returned to the President for his Address, and that he be requested to allow it to be printed."

The Statutes relating to election of the Council and Officers having been read, and Mr. C. V. Walker and Dr. Webster having been, with the consent of the Society, nominated Scrutators, the votes of the Fellows

present were collected, and the following were declared duly elected as Council and Officers for the ensuing year:—

President.—Lieut.-General Sir Edward Sabine, R.A., K.C.B., D.C.L., LL.D.

Treasurer.—William Allen Miller, M.D., D.C.L., LL.D.

Secretaries.— { Willim Sharpey, M.D., LL.D.
George Gabriel Stokes, Esq., M.A., D.C.L., LL.D.

Foreign Secretary.—Professor William Hallows Miller, M.A., LL.D.

Other Members of the Council.—Frederick Currey, Esq., M.A.; Warren De La Rue, Esq., Ph.D.; Sir Philip de M. Grey Egerton, Bart.; William Henry Flower, Esq.; William Huggins, Esq.; John Gwyn Jeffreys, Esq.; John Marshall, Esq.; Augustus Matthiessen, Esq., Ph.D.; George Henry Richards, Capt. R.N.; The Marquis of Salisbury, M.A.; Charles William Siemens, Esq.; John Simon, Esq.; Archibald Smith, Esq., M.A.; Prof. Henry J. Stephen Smith, M.A.; Prof. John Tyndall, LL.D.; Prof. Alexander W. Williamson, Ph.D.

The thanks of the Society were voted to the Scrutators.

The following Table shows the progress and present state of the Society with respect to the number of Fellows:—

	Patron and Royal.	Foreign.	Compounders.	£2 12s. yearly.	£4 yearly.	Total.
November 30, 1868.	4	48	289	2	257	600
Since elected		+3	+5		+12	+20
Since re-admitted ..					+2	+2
Since compounded..			+3		−3	
Since deceased		−2	−13	−2	−8	−25
November 30, 1869.	4	49	284		260	597

Receipts and Payments of the Royal Society between December 1, 1868, and November 30, 1869.

	£	s.	d.
Balance at Bank and on hand	493	14	6
Annual Subscriptions, Admission Fees, and Compositions	1618	4	0
Rents	252	5	7
Dividends	1476	10	5
Ditto, Trust Funds	281	4	3
Oliveira Bequest (subject to Duty)	1506	17	1
Davy Bequest	736	8	5
Sale of Transactions, Proceedings, &c.	383	19	9
Repayments	4	2	3
	£6753	6	3

	£	s.	d.	£	s.	d.
Salaries, Wages, and Pension				1084	13	0
The Scientific Catalogue				406	7	6
Oliveira Bequest, Deposit				1506	17	1
Books for the Library and Binding				242	7	4
Printing Transactions and Proceedings, Paper, Binding, Engraving, and Lithography				1681	4	8
General Expenses (as per Table subjoined)				358	10	0
Rumford Medal Fund	136	9	4			
Davy Medal Fund, Investment, &c.	728	17	3			
Donation Fund	17	15	0			
Wintringham Fund	35	2	0			
Copley Medal Fund	4	15	7	932	16	2
Dr. Andrews, Bakerian Lecture	4	0	0			
Rev. T. S. Evans, Fairchild Lecture	2	18	6			
Croonian Lecture, Poor of St. James's Parish	2	18	6			
Law Expenses				65	12	2
Legacy Duty, Oliveira Bequest				150	13	9
				6429	1	8
Balance at Bank				298	18	5
Balance of Catalogue Account				22	12	3
„ Petty Cash Account				2	13	11
				£6753	6	3

WILLIAM ALLEN MILLER,
Treasurer.

Estates and Property of the Royal Society, including Trust Funds.

Estate at Mablethorpe, Lincolnshire (55 A. 2 R. 2 P.), £126 per annum.
Estate at Acton, Middlesex (34 A. 2 R. 27½ P.), £109 10*s.* per annum.
Fee Farm near Lewes, Sussex, rent £19 4*s.* per annum.
One-fifth of the clear rent of an estate at Lambeth Hill, from the College of Physicians, £3 per annum.
£14,000 Reduced 3 per Cent. Annuities.
£29,569 15*s.* 7*d.* Consolidated Bank Annuities.
£513 9*s.* 8*d.* New 2½ per Cent. Stock—Bakerian and Copley Medal Fund.
£660 Madras Guaranteed 5 per Cent. Railway Stock—Davy Medal Fund.

Scientific Relief Fund.

Investments up to July 1865, New 3 per Cent. Annuities £6052 17 8

£6052 17 8

Dr. *Cr.*

	£	s.	d.		£	s.	d.
Balance	379	7	0	By Grants	175	0	0
Dividends	177	8	7	Balance	381	15	7
	£556	15	7		£556	15	7

Statement of Income and Expenditure (apart from Trust Funds) during the Year ending November 30, 1869.

	£	s.	d.					£	s.	d.
Annual Subscriptions	1072	4	0	Salaries, Wages, and Pension				1084	13	0
Admission Fees	170	0	0	The Scientific Catalogue				406	7	6
Compositions	376	0	0	Oliveira Bequest, Deposit				1506	17	1
Rents	252	5	7	Books for the Library				152	4	10
Dividends on Stock (exclusive of Trust Funds)	1008	9	2	Binding ditto				90	2	6
,, on Stevenson Bequest	468	1	3	Printing Transactions, Part II. 1868, and Part I. 1869	467	16	0			
Sale of Transactions, Proceedings, &c.	383	19	9	Ditto Proceedings, Nos. 105–114	430	17	7			
Oliveira Bequest	1506	17	1	Ditto Miscellaneous	62	4	9	1681	4	8
Repayments	4	2	3	Paper for Transactions and Proceedings ...	208	6	6			
				Binding and Stitching ditto	70	9	0			
				Engraving and Lithography	441	10	10			
Income available for the Year ending Nov. 30, 1869	5241	19	1	Law Expenses				65	12	2
Expenditure in the Year ending Nov. 30, 1869	5496	5	6	Legacy duty, Oliveira Bequest				150	13	9
				Fittings, Cleaning, and Repairs	82	18	4			
				Miscellaneous Expenses	34	7	3			
				Coal, Lighting, &c.	104	16	4			
				Tea Expenses	28	11	2			
				Fire Insurance	28	11	6			
				Stationery, &c.	15	15	4	358	10	0
				Taxes	13	4	8			
				Advertising	14	7	6			
				Postage, Parcels, and Petty Charges	33	15	11			
				Mablethorpe Schools, Donation	2	2	0			
Excess of Expenditure over Income in the Year ending Nov. 30, 1869	£254	6	5					£5496	5	6

WILLIAM ALLEN MILLER,
Treasurer.